B I D D I N G D O C U M E N T

for

The Work of Design, Engineering, Construction and Commissioning 10 MLD Sewage Treatment Plant with Biological Nutrient Removal (BNR) at Anjanapura-2 BDA layout with 10 MLD TSPS, Pumping Main and Operation & Maintenance for Seven Years.

(DBO contract)

Contract Package –
BWSSB - ANJ-2 - BDA

National Competitive Bidding (NCB)

EMPLOYER'S REQUIREMENT

VOLUME 2

DECEMBER– 2023

Employer: Bangalore Water Supply and Sewerage Board

Country: India

PART 11

PARTICULAR MECHANICAL REQUIREMENTS FOR TSPS AND STP

CONTENTS

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PARTICULAR MECHANICAL REQUIREMENTS FOR TSPS AND STP

LIST OF TABLES

Table 11- 1: Particular Mechanical Plant Requirement for 10MLD STP at Anjanapura 2

Table 11- 1: Particular Mechanical Plant Requirement for 10MLD STP at Anjanapura

Particular Mechanical Plant Requirement for 10MLD STP with TSPS at Anjanapura -2

S.No	Item	Type	Unit Process / Location	Minimum Number of Units				Minimum Installed Capacity per Unit		Minimum Requirements	Electrical Drive Type (CS/VFD)	Service (C/I)	No of Units Connected to STP Generator
				Working	Standby	Store	Total	Capacity	UOM				
A	**TSPS**												
1.00	TSPS Trash Screens	J-type Manual Coarse Bar Screen	TSPS	1.00	1.00	-	2.00	0.261	m3/s	Clear spacing between bars: 50mm, Bar thickness: 12mm, Bar width: 50 mm, Angle of inclination of screen: 90deg., Minimum width of channel: 1.1m, Maximum SWD at peak flow: 0.7m Bar cross section: Rectangular	-	-	-
2.00	Motorized Monorail Hoist for Trash Screen	Cross Travel & Lift	TSPS	1.00	-	-	1.00	2.00	MT	-	CS	I	-
3.00	TSPS Coarse Screens	Multirake type bar screen with mechanical cleaning and auto jam removal	TSPS	1.00	1.00	-	2.00	0.261	m3/s	Clear spacing between bars: 20mm, Bar thickness: 12mm, Bar width: 50 mm, Angle of inclination of screen: 75deg., Minimum width of channel: 1.1m, Maximum SWD at peak flow: 0.7m, Bar cross section: Trapezoidal	CS	I	2.00
4.00	Screening Conveyor with Screening Compactor	Helical Screw Type	TSPS	1.00	-	-	1.00	-	-	Minimum Length: 4m, Approx. Screw dia: 300 mm, MOC: SS 316 L	CS	I	1.00
5.00	Screen Container	Covered Hydraulic Tractor Trailer	TSPS	1.00	1.00	-	2.00	2.00	m3	-	-	-	-
6.00	TSPS Pumps	Submersible non-clog solids handling wet pit	TSPS	2.00	2.00	-	4.00	470.00	m3/h	-	VFD	C	4.00
7.00	Motorized Monorail Hoist	Motorized Monorail Hoist	TSPS	1.00	-	-	1.00	3.00	MT	-	CS	I	-
8.00	Dewatering Pumps	Submersible	TSPS	1.00	1.00	-	2.00	10.00	m3/h	-	CS	I	-
9.00	Exhaust Fans	Duct Mounted Axial flow fan	TSPS Pumping House	6.00	-	-	6.00	-	-	-	CS	C	6.00
B	**Headwork's**												

Particular Mechanical Plant Requirement for 10MLD STP with TSPS at Anjanapura -2

S.No	Item	Type	Unit Process / Location	Minimum Number of Units				Minimum Installed Capacity per Unit		Minimum Requirements	Electrical Drive Type (CS/VFD)	Service (C/I)	No of Units Connected to STP Generator
				Working	Standby	Store	Total	Capacity	UOM				
1.00	Fine Screens	Multirake type bar screen with mechanical cleaning and auto jam removal	Headwork's	1.00	1.00	-	2.00	0.27	m3/s	Clear spacing between bars: 6mm, Bar thickness: 10mm, Bar width: 40 mm, Angle of inclination of screen: 75deg., Minimum width of channel: 1.3m, Maximum SWD at peak flow: 0.8m, Bar cross section: Trapezoidal	CS	I	2.00
2.00	Screening Conveyor with Screening Compactor	Helical Screw Type	Headwork's	1.00	-	-	1.00	-	-	Minimum Length: 4m, Approx. Screw dia: 300 mm, MOC: SS 316 L	CS	I	1.00
3.00	Screen Container	Covered Hydraulic Tractor Trailer	Headwork's	1.00	1.00	-	2.00	2.00	m3	-	-	-	-
4.00	Vortex Grit Mechanism drive	Vortex grit mechanism with grit withdrawal (Slurry Pump) System	Headwork's	1.00	1.00	-	2.00	22,800.00	m3/d	Upper Portion Diameter: 3m, Other Dimensions of Vortex Type Grit Chamber Shall be As per Vendor	CS	C	2.00
5.00	Grit Transfer Pump	Vertical non-clog slurry Pump or Air Lift Pump	Headwork's	1.00	1.00	-	2.00	-	-	As per Vendor	CS	C	2.00
6.00	Grit Washer Mechanism		Headwork's	1.00	1.00	-	2.00	-	-	-	CS	C	2.00
7.00	Grit Discharge Conveyor	Helical Screw Type	Headwork's	1.00	1.00	-	2.00	-	-	Minimum Length: 3m, Approx. Screw dia: 300 mm, MOC: SS 316 L	CS	C	2.00
8.00	Grit Container	Covered Hydraulic Tractor Trailer	Headwork's	1.00	1.00	-	2.00	2.00	m3	-	-	-	-
9.00	Parshall Flume Section	Prefabricated Suitable to install in Channel	Headwork's	1.00	-	-	1.00	22,800.00	m3/d	MOC: SS 316 with thickness of 6mm (Converging portion, throat portion and diverging portion)	-	C	-
C	**SBR Tank**												
1.00	Decanter	Floating or electromechanically positioned with subsurface withdrawal and positive solids and scum exclusion mechanism. Fixed decanters or surface withdrawal not allowed	SBR Tank	4.00	-	-	4.00	120	m3/h/m	Decanter weir length shall be calculated based on 1.7 times the average flow. No of operating Decanters shall be minimum 1 per SBR tank. MOC of Complete Decanter shall be SS 316L	VFD	I	4.00

Particular Mechanical Plant Requirement for 10MLD STP with TSPS at Anjanapura -2

S.No	Item	Type	Unit Process / Location	Minimum Number of Units				Minimum Installed Capacity per Unit		Minimum Requirements	Electrical Drive Type (CS/VFD)	Service (C/I)	No of Units Connected to STP Generator
				Working	Standby	Store	Total	Capacity	UOM				
										Maximum decanting depth shall be calculated based on peak flow condition.			
2.00	Return Activated Sludge Pumps (Optional)	Submersible non-clog solids handling wet pit	SBR Tank	4.00	4.00	-	8.00	As per Bidder Design	m3/h	RAS pumps shall be capable of returning flows in the range not narrower than 0.35 to 0.55 times the average inlet flow to each SBR tank.	VFD	I	4.00
3.00	Waste Activated Sludge Pumps	Submersible non-clog solids handling wet pit	SBR Tank	4.00	4.00	-	8.00	As per Bidder Design	m3/h	Sludge Generation Fraction @ BOD: 0.76 kg / kg	VFD	I	4.00
4.00	Process Air Diffusers	Fine bubble membrane, tubular or disc, fixed type	Aeration Basin	100%	-	5%	105%	70.00	Nm3/hr/m2	Membrane material shall be EPDM or silicone elastomer with UV protection, and Max air flow per effective area of diffuser for design (at 20°C and 1atm) shall be 70Nm3/hr/m2	-	-	-
5.00	Motorized Monorail Hoist (For RAS/WAS Pumps)	Motorized Monorail Hoist	SBR Tanks	2.00	-	-	2.00	2.00	MT	-	CS	I	-
D	**Air Blower Building**												
1.00	Process Air Blowers	Rotary Tri-Lobe PD with VFD Control	Process Air Blower Building	2.00	1.00	-	3.00	6,950.00	m3/h (at Inlet)	-	VFD	C	1.00
2.00	EOT Crane	Fully EOT (LT,CT,Lift) (3 drives)	Process Air Blower Building	1.00	-	-	1.00	5.00	MT	-	CS	I	-
3.00	Exhaust Fans	Duct Mounted Axial flow fan	Process Air Blower Building	10.00	-	-	10.00	-	-	-	CS	C	10.00
E	**Scum System**												
1.00	Secondary Scum Pumps	Submersible chopper with recirculation valve	Scum Sump	1.00	1.00	-	2.00	5.00	m3/h	-	CS	I	-
2.00	Monorail, Chain pulley block with Travelling Trolley	Monorail, Chain pulley block with Travelling Trolley	Scum Sump	1.00	-	-	1.00	1.00	MT	-	-	-	-
F	**Alum Dosing System**												

Particular Mechanical Plant Requirement for 10MLD STP with TSPS at Anjanapura -2

S.No	Item	Type	Unit Process / Location	Minimum Number of Units				Minimum Installed Capacity per Unit		Minimum Requirements	Electrical Drive Type (CS/VFD)	Service (C/I)	No of Units Connected to STP Generator
				Working	Standby	Store	Total	Capacity	UOM				
1.00	Alum Dosing Pumps	Hydraulic double diaphragm	Chemical Building	1.00	1.00	-	2.00	100.00	LPH	-	VS	C	-
2.00	Alum Dosing Tanks	GRP or HDPE	Chemical Building	1.00	1.00	-	2.00	1.59	m3	-	-	-	-
3.00	Alum Solution Tank Mixers	Turbine	Chemical Building	1.00	1.00	-	2.00	1.59	m3	Minimum unit power input for mixing: 300W/m3	CS	C	-
4.00	Monorail, Chain pulley block with Travelling Trolley	Monorail, Chain pulley block with Travelling Trolley	Chemical Building	1.00	-	-	1.00	1.00	MT	-	-	-	-
5.00	Exhaust Fans	Flame Proof Exhaust Fan	Chemical Building	8.00	-	-	8.00	-	-	-	CS	C	8.00
G	**Disc Filters**												
1.00	Disc Filter Main Drive Mechanism	Main Drive		1.00	-	-	1.00	710.00	m3/h	-	CS	I	-
2.00	Backwash Pump mounted on Disc filter	Backwash Pumps		1.00	-	-	1.00	As per Vendor	m3/h	-	CS	I	-
H	**Chlorination System**												
1.00	Chlorinators	Vacuum type-Gas Feed	Chlorination Building	1.00	1.00	-	2.00	5.00	kg/h	-	CS	C	2.00
2.00	Chlorine Ejector	Inline vacuum induction	Chlorination Building	1.00	1.00	-	2.00	5.00	kg/h	-	CS	C	2.00
3.00	Booster Pumps	horizontal centrifugal	Chlorination Building	1.00	1.00	-	2.00	5.00	m3/h	-	CS	C	2.00
4.00	Chlorine Ton Cylinders	Steel (SA516 Gr 60)	Chlorination Building	4.00	-	-	4.00	900.00	Kgs	-	-	-	-
5.00	Chlorine Cylinder Load Cell	Electronic type	Chlorination Building	1.00	-	-	1.00	-	-	-	-	-	-
6.00	Motorized Monorail hoist	Motorized Monorail hoist	Chlorination Building	1.00	-	-	1.00	3.00	MT	-	CS	I	1.00
7.00	Chlorine Neutralization Pit		Chlorination Building	1.00	-	-	1.00	-	-	Size L-2.5m, W-1.5m, H-2.5m	-	-	-
8.00	Caustic Storage Tank	GRP	Adjacent to Chlorination Building	1.00	-	-	1.00	-	-		-	-	-
9.00	Emergency chlorine scrubber with all pumps (1W+1S), blowers (1W+1S) and other accessories for proper functioning of scrubber system	Caustic wet chemical scrubber - Automatic	Adjacent to Chlorination Building	1.00	-	-	1.00	1.00	Lot	-	CS	I	1.00

Particular Mechanical Plant Requirement for 10MLD STP with TSPS at Anjanapura -2

S.No	Item	Type	Unit Process / Location	Minimum Number of Units				Minimum Installed Capacity per Unit		Minimum Requirements	Electrical Drive Type (CS/VFD)	Service (C/I)	No of Units Connected to STP Generator
				Working	Standby	Store	Total	Capacity	UOM				
10.00	Exhaust Fans	Duct Mounted Axial flow fan	Chlorination Building	8.00	-	-	8.00	-	-	-	CS	C	8.00
I	**Plant Drain Sump**												
1.00	Plant Drain Transfer Pumps	Submersible Pump set	Plant Drain Sump	1.00	1.00	-	2.00	20.00	m3/h	-	CS	C	-
2.00	Monorail, Chain pulley block with Travelling Trolley	Monorail, Chain pulley block with Travelling Trolley	Plant Drain Sump	1.00	-	-	1.00	1.00	MT	-	-	-	-
J	**Sludge Handling Units**												
1.00	Centrifuge Feed Sump Mixers	Submersible	Centrifuge Feed Sump	1.00	-	-	1.00	173.60	m3	-	CS	C	-
2.00	Centrifuge Feed Pumps	Progressing Cavity	Centrifuge Feed Pump House	1.00	1.00	-	2.00	28.00	m3/h	-	VFD	I	-
3.00	EOT Crane	Fully EOT (LT,CT,Lift) (3 drives)	Centrifuge Feed Pump House	1.00	-	-	1.00	2.00	MT	-	CS	I	-
4.00	Polymer System (Tank, Polymer feeder, Mixers etc.,)	Tank, Polymer feeder, Mixers etc.,	Centrifuge Feed Pump House	1.00	1.00	-	2.00	2,300.00	Liters	Minimum unit power input for mixing: 200W/m3	CS	I	-
5.00	Polymer Dosing Pumps	Hydraulic double diaphragm	Centrifuge Feed Pump House	1.00	1.00	-	2.00	1,150.00	LPH	-	VS	I	-
6.00	Exhaust Fans	Flame Proof Exhaust Fan	Centrifuge Feed Pump House	6.00	-	-	6.00	-	-	-	CS	C	6.00
7.00	Dewatering Centrifuges	Solid Bowl Decanter Centrifuge	Centrifuge Building	1.00	1.00	-	2.00	28.00	m3/h	-	-	-	-
8.00	Main Drive			1.00	1.00	-	2.00	-	-	-	VFD	I	-
9.00	Back Drive			1.00	1.00	-	2.00	-	-	-	VFD	I	-
10.00	Dewatered Sludge Conveyor	Screw type	Centrifuge Building	1.00	-	-	1.00	-	-	-	CS	I	-
11.00	Dewatered Sludge Hoppers	Pneumatic / Hydraulic Operated Cut Gate	Centrifuge Building	1.00	1.00	-	2.00	-	-	-	CS	I	-
12.00	Dewatered Sludge Containers		Centrifuge Building	1.00	1.00	-	2.00	5.00	m3	-	-	-	-
13.00	Motorized Monorail Hoist	Motorized Monorail Hoist	Centrifuge Building	1.00	-	-	1.00	3.00	MT	-	CS	I	-
K	**Miscellaneous Items**												

Particular Mechanical Plant Requirement for 10MLD STP with TSPS at Anjanapura -2

S.No	Item	Type	Unit Process / Location	Minimum Number of Units				Minimum Installed Capacity per Unit		Minimum Requirements	Electrical Drive Type (CS/VFD)	Service (C/I)	No of Units Connected to STP Generator
				Working	Standby	Store	Total	Capacity	UOM				
1.00	Exhaust Fans	Wall mounted Exhaust Fan	Admin, Lab Building	4.00	-	-	4.00	-	-	-	CS	C	4.00
2.00	Air Conditioning	Duct Mounted Air-conditioning System	SCADA, Control room Building	2.00	-	-	2.00	2.00	Ton	-	CS	C	2.00
3.00	Air Conditioning	Split AC	Conference Hall, Engineers room	2.00	-	-	2.00	2.00	Ton	-	CS	I	2.00
4.00	Street Lighting		Complete Plant Area	100%	-	-	100%	-	-	-	CS	I	1.00
5.00	Decibel Meter and Ambient Temperature Meter		All process and non-process buildings including pump house	10.00	-	-	10.00	-	-	-	-	-	-
6.00	Earmuffs	Acoustic Type	-	10.00	-	-	10.00	-	-	-	-	-	-
7.00	Fresh air hose breathing apparatus	-	-	1.00	-	-	1.00	-	-	-	-	-	-

Legend: CS = Constant Speed; VFD = Variable Frequency Drive; VS = Variable Speed; C= Continuous; I = Intermittent; UOM = Unit of Measurement

End of Part 11